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AB - J09187249 Production of an emulsion containing functional material comprises emulsifying a mixture of functional substance, trehalose agent and water. Also claimed is the production of a powder containing functional substance by drying the emulsion.
- Trehalose and emulsifying agents are used in this preparation at 0.1-100 pts.wt. (preferably 1-50 pts.wt.) and 0.01-50 pts.wt. (preferably 0.1-10 pts.wt.) based on 1 pts.wt. functional material, respectively.
- USE - This preparation is used in various foods and drinks.
- ADVANTAGE - This preparation is stable on long-term storage and exerts no influence on the aroma, flavour, colour tone and taste of foods and drinks.
- In an example, gum arabic (200 g) and trehalose (200 g) were dissolved in water (500 g), heated at 85-90 degrees C for 15 min. and then cooled to 40 degrees C. A mixture of docosahexaenoic acid (DHA) (10 g), middle chain fatty acid triglyceride (30 g) and SAIB (sucrose.diacetate.hexaisobutyrate)(60 g) was added to the solution and the mixture was emulsified by TK-homomixer and further emulsified by high pressure homogeniser (300 kg/cm2) to give 950 g of DHA-containing emulsion.
- (Dwg.0/0)
IW - PRODUCE EMULSION POWDER CONTAIN FUNCTION MATERIAL MADE EMULSION MIXTURE FUNCTION SUBSTANCE TREHALOSE EMULSION AGENT WATER
IKW - PRODUCE EMULSION POWDER CONTAIN FUNCTION MATERIAL MADE EMULSION MIXTURE FUNCTION SUBSTANCE TREHALOSE EMULSION AGENT WATER
NC - 001
OPD - 1996-01-12
ORD - 1997-07-22
PAW - (HASE) HASEGAWA CO LTD
TI - Production of emulsion or powder containing functional material - made by emulsifying mixture of functional substance, trehalose, emulsifying agent and water

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(71)【出願人】

【識別番号】０００２１４５３７

【氏名又は名称】長谷川香料株式会社

【住所又は居所】東京都中央区日本橋本町４丁目４番１４号

(72)【発明者】

【氏名】知野　善明

【住所又は居所】神奈川県川崎市中原区苅宿３３５　長谷川香

(57)【要約】

【課題】　機能性物質の保存安定性に優れ、各種の飲食品に利用することができ、これら飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく長期間安定であり、機能性を十分に発現できる乳化又は粉末機能性物質の製造方法を提供する。

【解決手段】　機能性物質、トレハロース、乳化剤及び水を含む混合物を乳化および乾燥することにより、乳化又は粉末機能性物質を得る。

【特許請求の範囲】

【請求項１】　機能性物質、トレハロース、乳化剤及び水を含む混合物を乳化することを特徴とする乳化機能性物質の製造方法。

【請求項２】　請求項１記載の乳化機能性物質を乾燥することを特徴とする粉末機能性物質の製造方法。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、機能性物質の保存安定性に優れ、各種の飲食品に利用することができ、これら飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく長期間安定であり、機能性を十分に発現できる乳化機能性物質及び粉末機能性物質の製造方法に関し、さらに詳しくは、機能性物質、トレハロース、乳化剤及び水を含む混合物を乳化することを特徴とする、乳化機能性物質の製造方法及び該乳化機能性物質を乾燥することを特徴とする粉末機能性物質の製造方法に関する。

(71) [Applicant]

[Applicant Code] 000214537

[Name] T. HASEGAWA CO., LTD.

[Address] Tokyo Chuo-ku Nihonbashi Honmachi 4-C home 4-14

(72) [Inventor]

[Name] Chino　Yoshiaki

(57) [Abstract]

[Problem]　It is superior in storage stability of function al substance, it is possible to utilize inthe various food and beverage, it is a long term stability fragrance of these food and beverage,without giving what adverse effect to aroma , color tone and tastiness etc, manufacturing method of emulsification or powder functional substance which can reveal the functionality in fully is offered.

[Means of Solution]　Emulsification or powder functio nal substance is obtained by emulsifying and dries themixture which includes functional substance , trehalose , emulsifier and waterand.

[Claim(s)]

[Claim 1]　Manufacturing method of emulsifier capabil ity substance which designates that blend which includesthe functional substance , trehalose , emulsifier and water is emulsified asfeature.

[Claim 2]　Manufacturing method of powder functiona l substance which designates that emulsifier capability substance which is statedin Claim 1 is dried as feature.

[Description of the Invention]

[0001]

[Technological Field of Invention] As for this inventio n, In storage stability of functional substance to be superior, Thing which is utilized in various food and beverage to do, fragrance of these food and beverage, aroma , color , Being a long term stability, without giving what adverse effect to tastiness etc to be, It regards manufacturing method of emulsifier capability substance and powder functional substance which can reveal the functionality in fully, it regards manufacturing method of powder functional substance wherefurthermore details designate that blend which includes functional substance ,the trehalose ,

emulsifier and water is emulsified as feature, designatethe manufacturing method of emulsifier capability substance and that said emulsifier capability substance is dried as feature.

【０００２】

【従来の技術】従来、飲料、その他の食品に、例えば、脳機能改善作用やコレステロール低下作用などの生理活性作用を付与した健康食品を提供する目的で、機能性物質を植物性天然ガム質溶液であるアラビアガム溶液、あるいは化工でん粉、デキストリンのごとき乳化剤、賦形剤などを用いて乳化して乳状液としたり、又は、その乳状液を噴霧乾燥して粉末にして使用することが一般的に行われている。また、油性機能性物質をショ糖脂肪酸エステル、グリセリン脂肪酸エステル、ポリグリセリン脂肪酸エステルなどの合成界面活性剤、適当な賦形剤などを用いて乳化し、噴霧乾燥する方法も行われている。

[0002]

[Prior Art] Until recently, in beverage and other foodstuff, with object whichoffers health food which grants for example cerebral function improving action and cholesterol decreasing action or other physiological activity, emulsifying the functional substance gum arabic solution or chemical engineering starch which is a vegetable natural gum substance solution,making use of dextrin or other emulsifier and excipient , etc it makes emulsifiedliquid, or, spray drying does emulsified liquid and using inthe powder is done generally. In addition, it emulsifies oily functional substance making use of sucrose fatty acid ester , the glycerin fatty acid ester , polyglycerine fatty acid ester or other synthetic surfactant and suitable excipient etc, also method which spray drying isdone is done.

【０００３】しかしながら、機能性物質を乳化剤、賦形剤などの存在下に乳化して得られる乳状液、又は、この乳状液を、例えば噴霧乾燥して得られる粉末は、含有される機能性物質の保存安定性が悪く、劣化臭発生の原因ともなり必ずしも満足できるものではない。

[0003] But, emulsifying functional substance under emulsifier and excipient or other existence, theemulsified liquid which is acquired, or, for example spray drying doing thisemulsified liquid, as for powder which is acquired, thestorage stability of functional substance which is contained is bad, it is not somethingwhere becomes also cause of deterioration odor occurrence andalways can be satisfied.

【０００４】

【発明が解決しようとする課題】本発明の目的は、機能性物質の保存安定性に優れ、各種の飲食品に利用することができ、これら飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく長期間安定であり、機能性を十分に発現できる乳化又は粉末機能性物質の製造方法を提供するにある。

[0004]

[Problems to be Solved by the Invention] Objective of this invention is superior in storage stability of functional substance, it ispossible to utilize in various food and beverage, it is a long term stability thefragrance of these food and beverage, without giving what adverse effect to aroma , the color tone and tastiness etc, it is to offer manufacturing method of emulsification orthe powder functional substance which can reveal functionality in fully.

【０００５】

【課題を解決するための手段】本発明者らは上記のごとき欠点を有する従来型の機能性物質含有乳状液又は粉末について、その欠点を解決すべく鋭意研究を行った。その結果、例えば、でん粉を酵素分解して得られる、グルコースがα，α－１，１結合で２個つながった二糖類、すなわちトレハロースを、乳化又は粉末機能性物質の製造の乳化の際に添加することにより、得られた乳化又は粉末機能性物質（以下、機能性製剤と略称することもある）は長期間安定に保存することが可能になり、また、各種飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく安定であり、機能性を十分に発現できるという事実を見いだし、本発明を完成するに至った。

[0005]

[Means to Solve the Problems] These inventors in order that deficiency is solved concerning functional substance content emulsified liquid or powder of conventional which possesses theabove-mentioned or other deficiency, did diligent research . As a result, enzymolysis doing for example starch, it is acquired, glucose being , - 1,1 connection, 2 it was connected disaccharides , Namely trehalose, In adding to case of emulsification or emulsification ofproduction of powder functional substance to depend, as for emulsification or powder functional substance (Below , functionality formulation there are also times when it

abbreviates.) which is acquired itbecomes possible to retain in long term stability, in addition, it is astability fragrance of various food and beverage, without giving thewhat adverse effect to aroma , color and tastiness etc, you discoveredthe fact that this invention reached to completion it can reveal functionalityin fully.

【０００６】かくして、本発明によれば、機能性物質、トレハロース及び水を含む混合物を乳化および乾燥することにより、機能性物質の保存安定性に優れ、各種の飲食品に利用することができ、これらの飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく長期間安定であり、機能性を十分に発現できる乳化機能性物質及び粉末機能性物質の製造方法が提供される。

[0006] In this way doing, In this invention we depend, functional substance , In emulsifying and drying blend which includes trehalose and thewater and to depend, It is superior in storage stability of functional substance, it is possible to utilize inthe various food and beverage, it is a long term stability fragrance of these food and beverage,without giving what adverse effect to aroma , color and tastiness etc, manufacturing method of emulsifier capability substance and powder functional substance which can reveal functionalityin fully is offered.

【０００７】以下、本発明について更に詳細に述べる。

[0007] Furthermore you express in detail below, concerning this invention.

【０００８】本発明において使用しうる機能性物質は、特に制限されるものでなく、例えば、ドコサヘキサエン酸（ＤＨＡ）、エイコサペンタエン酸（ＥＰＡ）、ＤＨＡ及びＥＰＡ含有魚油、リノール酸、γ－リノレン酸、α－リノレン酸、月見草油、ボラージ油、レシチン、オクタコサノール、ローズマリー、セージ、γ－オリザノール、β－カロチン、パームカロチン、シソ油、キチン、キトサン、ロイヤルゼリー、プロポリス、及び油溶性ビタミン類などを挙げることができる。

[0008] Regarding to this invention, it can use as for functional substance which, Especially, not to be something which is restricted, for example docosahexaenoic acid (DHA), the eicosapentaenoic acid (EPA), DHA and EPA content fish oil , linolic acid , - linolinic acid ,the - linolinic acid , evening primrose oil and bora - di oil , lecithin , octaconasol , the rosemary , sage , - oryzanol , - carotene , palm carotene , perilla oil , the chitin , chitosan , Royal jelly , propolis and and oil-soluble vitamin etccan be listed.

【０００９】また、本発明で使用するトレハロースは、例えば、ブドウ糖溶液中で酵母を培養して、酵母菌体中にトレハロースをつくらせ、このトレハロースを菌体から分離する方法、ブドウ糖溶液中でバクテリアを培養し培養液中にトレハロースをつくらせ、このトレハロースを培養液から分離する方法などの方法で製造することができるが、市販のトレハロースを利用することもできる。このトレハロースの使用量は、使用する機能性物質の種類及び形態、乳化剤の種類などにより適宜に選択することができるが、一般には、機能性物質１重量部に対して約０．１～約１００重量部、好ましくは約１～約５０重量部の範囲内が適当である。

[0009] In addition, method trehalose which is used with this invention,culturing yeast in for example fructose solution, making trehalose make in yeast, separating this trehalose from cell mass. It can culture bacteria in fructose solution and to make trehalose culture mediummake, it can produce with method or other method which separates this trehalose fromthe culture fluid, but it is possible also to utilize commercial trehalose. It can select amount used of this trehalose, appropriately due to types and form of functional substance which is used and types etc of the emulsifier, but generally, approximately 0.1 to approximately 100 parts by weight , theinside of range of preferably approximately 1 to approximately 50 parts by weightis suitable vis-a-vis functional substance 1 part by weight.

【００１０】さらに、本発明で使用する乳化剤も特に制限されるものではなく、従来から飲食品等に用いられている各種の乳化剤が使用可能であり、例えば、脂肪酸モノグリセリド、脂肪酸ジグリセリド、脂肪酸トリグリセリド、プロピレングリコール脂肪酸エステル、ショ糖脂肪酸エステル、ポリグリセリン脂肪酸エステル、レシチン、化工でん粉、ソルビタン脂肪酸エステル、キラヤ抽出物、アラビアガム、トラガントガム、グアー

[0010] Furthermore, It to be something where also emulsifier which is used with this inventionespecially is restricted, Various emulsifier which from until recently are used for thefood and beverage etc are usable, for example aliphatic acid monoglyceride , aliphatic acid diglyceride , aliphatic acid triglyceride , propylene glycol aliphatic ester ,the sucrose aliphatic ester ,

ガム、カラヤガム、キサンタンガム、ペクチン、アルギン酸及びその塩類、カラギーナン、ゼラチン、カゼイン等を挙げることができる。

polyglycerine aliphatic ester , lecithin and chemical engineering starch ,the sorbitan aliphatic ester , quillaja extract , gum arabic , traganth gum , guar gum , karaya gum , the xanthan gum , pectin , alginic acid and its salt, carageenan , gelatin and casein etccan be listed.

【００１１】これら乳化剤の使用量は厳密に制限されるものではなく、用いる乳化剤の種類等に応じて広い範囲にわたり変えることができるが、通常、機能性物質１重量部に対し約０．０１～約５０重量部、好ましくは約０．１～約１０重量部の範囲内が適当である。

[0011] Amount used of these emulsifier is not somethi ng which is restrictedstrictly, it is possible to change according to types etc of theemulsifier which is used over wide range, but approximately 0.01 toapproximately 50 parts by weight , inside of range of preferably approximately0.1 to approximately 10 parts by weight is suitable usually, vis-a-vis the functional substance 1 part by weight.

【００１２】本発明によれば、機能性物質、トレハロース及び水を乳化剤の存在下に乳化することにより、乳化機能性物質を容易に製造することができる。また、乳化機能性物質を、適当な乾燥手段により乾燥することにより、容易に粉末機能性物質を製造することができる。上記の乳化に際して、必要に応じて、デキストリン、砂糖、乳糖、ブドウ糖、水飴、還元水飴等の糖類を適宜配合することもできる。これらの使用量は機能性製剤に望まれる特性等に応じて適宜に選択することができる。

[0012] emulsifier capability substance can be produce d easily according to this invention, byemulsifying functional substance , trehalose and water under existing of theemulsifier. In addition, powder functional substance can be produced easily by drying emulsifier capability substance,with suitable drying means . At time of above-mentioned emulsification, it is possible also tocombine according to need , dextrin , sugar , lactose , fructose , the malt syrup and reduced malt syrup or other saccharides appropriately. It can select these usage appropriately according to characteristic etcwhich is desired to functionality formulation.

【００１３】

[0013]

【発明の実施の形態】本発明の機能性製剤の調製法の好ましい一実施態様を示せば、例えば、まず水１２０重量部に前記した如き乳化剤４０重量部とトレハロース４０重量部を溶解させ、それに前記した如き機能性物質２０重量部を添加し、ホモミキサー、コロイドミル、高圧ホモジナイザー等を用いて乳化処理を行い、乳化製剤を得る。また、この乳化製剤を真空乾燥、噴霧乾燥等の乾燥手段で乾燥することにより、粉末製剤とすることができる。このようにして得られた製剤は、保存安定性に優れた機能性製剤である。

[Embodiment of Invention] If embodiment where prepar ation method of functionality formulation of this invention is desirable isshown, melting emulsifier 40 parts by weight and kind of trehalose 40 parts by weight which for example firstbefore were inscribed to water 120 parts by weight, before, it adds kind offunctional substance 20 parts by weight which was inscribed to that, it does emulsification process making use of the homogenizer , colloid mill and high pressure homogenizer, etc obtains emulsified formulation. In addition, it can make powder formulation this emulsified formulation by drying with vacuum drying and spray drying or other drying means. formulation which it acquires in this way is functionality formulation which is superiorin storage stability.

【００１４】かくして、上述のようにして得られる機能性製剤は、例えば、飲料、粉末飲料、デザート、チューインガム、錠菓、スナック類、水産加工食品、畜肉加工食品、レトルト食品などの飲食品に利用することができる。これら飲食品に配合される機能性製剤の使用量は、飲食品の種類、形態などにより異なるが、一般的には飲食品１重量部に対して約０．００１～約０．１重量部の範囲内で使用することができる。

[0014] for example beverage , powder beverage , des sert , chewing gum , lozenge , snack, itcan utilize functionality formulation which is acquired this way, above-mentionedway, in processed seafood , meat processed food and retort food or other food and beverage. amount used of functionality formulation which is combined in these food and beverage differsdepending upon types and form etc of food and beverage, but generallyyou can use inside range of approximately 0.001 to approximately 0.1 parts by

【００１５】次に実施例を挙げて本発明をさらに具体的に説明する。

【００１６】

【実施例】

実施例１

水５００ｇにアラビアガム２００ｇ及びトレハロース２００ｇを加えて溶解し、８５～９０℃で１５分間加熱殺菌した後、これを４０℃に冷却する。別にＤＨＡ１０ｇ、中鎖脂肪酸トリグリセリド３０ｇ、ＳＡＩＢ（シュークロース・ジアセテート・ヘキサイソブチレート）６０ｇ混合溶解したものを、先のアラビアガム、トレハロース混合液に添加した後、ＴＫ－ホモミキサーで予備乳化した。更に、この液を高圧ホモジナイザーにて３００Ｋｇ／ｃｍ^{2}の圧力で乳化し、ＤＨＡ含有乳化製剤９５０ｇ（本発明品１）を得た。

【００１７】参考例１

実施例１のトレハロースの代わりにグリセリンを同量使用した他は、実施例１と同様の操作を行いＤＨＡ含有乳化液９５０ｇ（参考品１）を得た。

【００１８】実施例２

水４００ｇにグリセリン２４０ｇ、ポリグリセリンモノオレエート２０ｇ及びトレハロース３００ｇを加えて溶解し、８５～９０℃で１５分間加熱殺菌し、６０℃に冷却した。この溶液をＴＫ－ホモミキサーで撹拌しながらオクタコサノール４０ｇを中鎖飽和脂肪酸トリグリセリド６０ｇに溶解した液を添加混合して予備乳化し、更に高圧ホモジナイザーにて２００Ｋｇ／ｃｍ^{2}の圧力で乳化し、オクタコサノール含有乳化製剤１０００ｇ（本発明品２）を得た。

【００１９】参考例２

実施例２のトレハロースの代わりにＤ－ソルビトールを同量使用した他は、実施例２と同様の操作を行いオクタコサノール含有乳化製剤１０００ｇ（参考品２）を得た。

【００２０】比較例１

実施例１、２及び参考例１、２で得られた乳化機能性物質を用いて、下記に示す処方に従って飲料を調製した。

weightvis-a-vis food and beverage 1 part by weight.

[0015] Listing Working Example next, furthermore yo u explain this invention concretely.

[0016]

[Working Example(s)]

Working Example 1

It melts in water 500g including gum arabic 200g and trehalose 200g, withthe 85 to 90 °C 15 min heat sterilization after doing, it cools this in 40 °C. Separately DHA 10g, those which medium chain fatty acid triglyceride 30g, SAIB(sucrose * diacetate * hexa isobutanoate)60g it mixes melts, thegum arabic ahead, after adding to trehalose mixed solution, preparatory emulsification were done with theTK - homogenizer. Furthermore, this liquid with high pressure homogenizer was emulsified with pressureof 300 kg/cm2, DHA-containing emulsified formulation 950g(article of this invention 1) was acquired.

[0017] Reference Example 1

Besides same amount you use glycerin, operation of be ing similar tothe Working Example 1 was done in place of trehalose of Working Example 1 and DHA-containing emulsion 950g (Reference item 1)was acquired.

[0018] Working Example 2

It melted in water 400g including glycerin 240g, poly glycerine mono oleate 20g and thetrehalose 300g, 15 min heat sterilization did with 85 to 90 °C, cooled in 60 °C. While agitating this solution with TK - homogenizer, adding and mixing doing liquidwhich melts octaconasol 40g in medium chain saturated aliphatic acid triglyceride 60g, preparatory emulsification it did, furthermore withthe high pressure homogenizer emulsified with pressure of 200 kg/cm2, acquired octaconasol content emulsified formulation 1000g(article of this invention 2).

[0019] Reference Example 2

Besides same amount you use D - sorbitol, operation o f being similar tothe Working Example 2 was done in place of trehalose of Working Example 2 and octaconasol content emulsified formulation 1000g (Reference item 2) was acquired.

[0020] Comparative Example 1

Following to formulation which is shown on descripti on below, making useof emulsifier capability substance which is acquired with Working Example 1, 2 and

【００２１】

処方例

	Ｎｏ１	Ｎｏ２	Ｎｏ３	Ｎｏ４
グラニュー糖	100.0g	100.0g	100.0g	100.0g
クエン酸	0.2	0.2	0.2	0.2
水	900.0	900.0	900.0	900.0
本発明品１	0.1	—	—	—
本発明品２	—	0.1	—	—
参考品１	—	—	0.1	—
参考品２	—	—	—	0.1
合計	1000.3	1000.3	1000.3	1000.3

【００２２】上述の処方で調製した飲料を２５０ｃｃのジュース瓶にホットパックし、冷却後、３７℃にて３ケ月間保存した。保存後、この飲料を専門パネラー１０名にて、香気香味の官能評価を行った。その結果、専門パネラーの全員が、本発明品１及び２を配合したＮｏ１及びＮｏ２は、ともに保存による劣化臭は認められず良好な香気香味を保持していると判定した。一方、参考品１及び２を配合したＮｏ３及びＮｏ４は、ともに保存による著しい劣化臭が認められると判定した。このことから、トレハロースは、機能性物質の保存安定性に優れた効果を有し、極めて有用であることがわかる。

【００２３】実施例３

水１００ｇに化工でん粉２０ｇ、デキストリン５０ｇ及びトレハロース２０ｇを加えて溶解し、８５～９０℃で１５分間加熱殺菌する。これを４０℃に冷却し、ＤＨＡ含有精製魚油１０ｇを添加混合した後、ＴＫ－ホモミキサーで乳化した。この液をニロ社のモービルマイナー型スプレードライヤーを使用して、入口温度１４０℃、出口温度７５℃にて噴霧乾燥し、ＤＨＡ含有精製魚油粉末製剤９５ｇ（本発明品３）を得た。

Reference Example 1, 2, itmanufactured beverage.

[0021]

Formulation example

	No1	No2	No3	No4
Granular sugar	100.0g	100.0g	100.0g	100.0g
Citric acid	0.2	0.2	0.2	0.2
Water	900.0	900.0	900.0	900.0
Article of this invention 1	0.1	-	-	-
Article of this invention 2	-	0.1	-	-
Reference item 1	-	-	0.1	-
Reference item 2	-	-	-	0.1
Total	1000.3	1000.3	1000.3	1000.3

[0022] Hot pack it did beverage which is manufactured with theabove-mentioned formulation in juice bottle of 250 cc, after cooling, the3 months retained with 37 °C . After retaining, this beverage with expert panel member 10 persons , sensory evaluation of fragrance and flavor wasdone. As a result, as for No1 or No2 which combine article of this invention 1 and 2, asfor deterioration odor together due to retention it could notrecognize all members of expert panel member and, it decided that satisfactoryfragrance and flavor is kept. On one hand, considerable deterioration odor where No3 andthe No4 which combine reference item 1 and 2 are due to retentiontogether decided signet and others with. From this, trehalose has effect which is superior in thestorage stability of functional substance, it understands that quite it is useful.

[0023] Working Example 3

It melts in water 100g chemical engineering starch 20g, includingthe dextrin 50g and trehalose 20g, 15 min heat sterilization does with 85 to 90 °C. This was cooled in 40 °C, adding and mixing after doing DHA-containing purified fish oil 10g, wasemulsified with TK - homogenizer. Using Mobile minor type spray dryer of Niro corporation, spray drying it didthis liquid with inlet temperature 140 °C , and outlet

temperature 75 °C acquired DHA-containing purified fish oil powder formulation 95g(article of this invention 3).

【００２４】参考例３

実施例３のトレハロースの代わりにデキストリン（ＤＥ１０）を同量使用した他は、実施例３と同様に行いＤＨＡ含有精製魚油粉末９５ｇ（参考品３）を得た。

[0024] Reference Example 3

It did besides same amount you use dextrin (DE10), in same way as the Working Example 3 in place of trehalose of Working Example 3 and acquired DHA-containing purified fish oil powder 95g (Reference item 3).

【００２５】実施例４

水１００ｇにＨＬＢ１５のショ糖脂肪酸エステル５ｇ、ＤＥ１０のデキストリン４５ｇ及びトレハロース３０ｇを加えて溶解し、８５～９０℃で１５分間加熱殺菌した。この溶液を約４０℃に冷却後、ＴＫ－ホモミキサーで撹拌しながらγ－リノレン酸２０ｇを添加混合して乳化液を得た。この液を実施例３と同様に噴霧乾燥してγ－リノレン酸含有粉末製剤９５ｇ（本発明品４）を得た。

[0025] Working Example 4

It melted in water 100g sucrose fatty acid ester 5g of HLB15, including thedextrin 45g and trehalose 30g of DE10, 15 min heat sterilization did with 85 to 90 °C. While in approximately 40 °C after cooling, agitating this solution withthe TK - homogenizer, adding and mixing doing - linolinic acid 20g, it acquired emulsion. spray drying doing this liquid in same way as Working Example 3, it acquiredthe - linolinic acid content powder formulation 95g(article of this invention 4).

【００２６】参考例４

実施例４のトレハロースの代わりに砂糖を同量使用した他は、実施例４と同様の操作を行いγ－リノレン酸含有粉末９５ｇ（参考品４）を得た。

[0026] Reference Example 4

Besides same amount you use sugar, operation of bein g similar tothe Working Example 4 was done in place of trehalose of Working Example 4 and - linolinic acid content powder 95g (Reference item 4) was acquired.

【００２７】比較例２

実施例３、４及び参考例３、４で得られた機能性物質含有製剤及び粉末を用いて、下記に示す処方に従って粉末飲料を調製した。粉末飲料５０ｇをそれぞれポリ袋に入れ、３７℃にて３ケ月間保存した。

[0027] Comparative Example 2

Following to formulation which is shown on descripti on below, making useof functional substance content formulation and powder which are acquired with theWorking Example 3, 4 and Reference Example 3, 4, it manufactured powder beverage. You inserted powder beverage 50g in poly bag respectively, 3 months retainedwith 37 °C .

【００２８】

[0028]

処方例

	Ｎｏ５	Ｎｏ６	Ｎｏ７	Ｎｏ８
グラニュー糖	42.4g	42.4g	42.4g	42.4g
グルコース	24.0	24.0	24.0	24.0
クエン酸	2.0	2.0	2.0	2.0
ビタミンＣ	0.5	0.5	0.5	0.5

Formulation example

	No5	No6	No7	No8
Granular sugar	42.4g	42.4g	42.4g	42.4g
Glucose	24.0	24.0	24.0	24.0
Citric acid	2.0	2.0	2.0	2.0
Vitamin C	0.5	0.5	0.5	0.5

クエン酸ナトリウム	1.0	1.0	1.0	1.0
本発明品３	0.1	−	−	−
本発明品４	−	0.1	−	−
参考品３	−	−	0.1	−
参考品４	−	−	−	0.1
合計	70.0	70.0	70.0	70.0

Sodium citrate	1.0	1.0	1.0	1.0
Article of this invention 3	0.1	-	-	-
Article of this invention 4	-	0.1	-	-
Reference item 3	-	-	0.1	-
Reference item 4	-	-	-	0.1
Total	70.0	70.0	70.0	70.0

【００２９】上述の３ケ月間保存した粉末飲料７ｇを水１００ｇで希釈し、専門パネラー１０名にて、香気香味の官能評価を行った。その結果、専門パネラーの全員が、本発明品３及び４を配合したＮｏ５及びＮｏ６は、ともに保存による劣化臭は認められず良好な香気香味を保持していると判定した。一方、参考品３及び４を配合したＮｏ７及びＮｏ８は、ともに保存による著しい劣化臭が認められると判定した。このことから、トレハロースは、機能性物質の保存安定性に優れた効果を発揮し、極めて有用であることがわかる。

[0029] Above-mentioned 3 months powder beverage 7 g which is retained was diluted withthe water 100g, with expert panel member 10 persons , sensory evaluation of fragrance and flavor was done. As a result, as for No5 or No6 which combine article of this invention 3 and 4, asfor deterioration odor together due to retention it could notrecognize all members of expert panel member and, it decided that satisfactoryfragrance and flavor is kept. On one hand, considerable deterioration odor where No7 andthe No8 which combine reference item 3 and 4 are due to retentiontogether decided signet and o[illegible]with. From this, trehalose shows effect which is superior in thestorage stability of functional substance, it understands that quite it is useful.

【００３０】

【発明の効果】本発明によれば、機能性物質の保存安定性に優れ、各種の飲食品に利用することができ、これら飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく長期間安定であり、機能性を十分に発現できる乳化又は粉末機能性物質の製造方法を提供するにある。

[0030]

[Effects of the Invention] According to this invention, i t is superior in storage stability of functional substance, itis possible to utilize in various food and beverage, it is a long term stability thefragrance of these food and beverage, without giving what adverse effect to aroma , the color tone and tastiness etc, it is to offer manufacturing method of emulsification orthe powder functional substance which can reveal functionality in fully.